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INFORMATION REPORT INFORMATION REPORT

CENTRAL INTELLIGENCE AGENCY

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"Investigation of the Propagation of Ultra-Short Waves in the Troposphere"

1. In previous research it was proven that a mathematical calculation of wave propagation problems in the area immediately beyond the horizon correctly predicts variations in the field intensities at the receiver, which were obtained experimentally, if the corresponding variations of meteorological conditions are taken into consideration in the calculations. Investigation revealed that partial reflections in inversion layers, in addition to refraction and diffraction, noticeably affected field intensities received. Thus, a correlation between the variations of meteorological conditions and field intensity was indicated for the first time. The results of this work were published, and now the theoretical research on the wave propagation mechanism in this field, within the limits of the research project, can be considered finished.

2. Consideration of economic factors requires additional statistical measurements. Of special interest here is the dependency of field intensity on distance and time of day and year. Sufficient material, especially from the meteorological observatory in Kuehlungsborn, is available for distances over 100 kilometers. Recordings on the HHI 76-kilometer measuring line at 68 MHz (megacycles) closes the gap in our knowledge up to the horizon. For that reason, measurements were continued until the early part of 1956 so that statistical material for a period of time longer than one year would be available. Aside from the possibility of calculating field intensity at the receiver by means of a theoretical process, it is possible for practical purposes to estimate temporal variations in this wave propagation range from recorded data. Work on the research project is completed.

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